IN THE CLAIMS:

Claims 1-94. (Canceled).

95. (New) A method of making an oxidation and wear resistant ultrahigh molecular weight polyethylene (UHMWPE) for use in a medical implant, wherein the method comprises:

(a) providing consolidated and cross-linked UHMWPE that has been irradiated with ionizing radiation;

(b) doping the consolidated and cross-linked UHMWPE with vitamin E by diffusion, thereby allowing formation of a gradient of vitamin E in the consolidated and cross-linked UHMWPE; and

(c) annealing the consolidated and cross-linked UHMWPE at a temperature below its melting point to increase the uniformity of the vitamin E distribution in the consolidated and cross-linked UHMWPE such that the vitamin E can react with free radicals throughout the consolidated and cross-linked UHMWPE,

wherein the method provides a consolidated and cross-linked UHMWPE that is oxidation and wear resistant and can be used in a medical implant.

96. (New) The method of claim 95, wherein the doping is carried out by soaking the medical implant in vitamin E for about an hour to about 16 hours.

97. (New) The method of claim 95, wherein the vitamin E is heated to about 100°C or more and the doping is carried out at 100°C or more.

98. (New) A method of making a medical implant comprising oxidation and wear resistant ultrahigh molecular weight polyethylene (UHMWPE), wherein the method comprises:

(a) providing consolidated and cross-linked UHMWPE that has been irradiated with ionizing radiation;

(b) doping the consolidated and cross-linked UHMWPE with vitamin E by diffusion, thereby allowing formation of a gradient of vitamin E in the consolidated and cross-linked UHMWPE; and

(c) annealing the consolidated and cross-linked UHMWPE at a temperature below its melting point to increase the uniformity of the vitamin E distribution in the consolidated and cross-linked UHMWPE such that the vitamin E can react with free radicals throughout the consolidated and cross-linked UHMWPE, and

(d) machining the consolidated and cross-linked UHMWPE, thereby forming the medical implant comprising oxidation and wear resistant UHMWPE.

99. (New) The method of claim 98, wherein the medical implant is packaged and sterilized by ionizing radiation or gas sterilization.

100. (New) The method of claim 98, wherein the doping is carried out by soaking the medical implant in vitamin E for about an hour to about 16 hours.

101. (New) The method of claim 98, wherein the vitamin E is heated to about 100°C or more and the doping is carried out at 100°C or more.

102. (New) The method according to claim 98, wherein the medical implant forms all or part of one selected from the group consisting of acetabular liner, shoulder glenoid, patellar component, finger joint component, ankle joint component, elbow joint component, wrist joint component, toe joint component, bipolar hip replacements, tibial knee insert, tibial knee inserts with reinforcing metallic and polyethylene posts, intervertebral discs, sutures, tendons, heart valves, stents, and vascular grafts.